

## RIVERS AND FLOODS.

By H. C. FRANKENFIELD, Meteorologist.

Reference to the flood table following this report will disclose the fact that floods were quite numerous, and of wide distribution as well, east of the Rocky Mountains. It will also be noted that none of the floods was serious, neither as to stage, duration, nor extent, and that the greater number occurred about the middle and near the close of the month. The somewhat severe Ohio River flood of early January, 1924, set in in full force on the first day of that month, following the heavy and general rains and high temperatures of the previous day, although the river from Evansville, Ind., to Shawneetown, Ill., had already passed the flood stage after a slow and steady rise caused by the rather frequent and substantial rains from December 13 to 24, inclusive. A report on the floods in the Ohio River and its tributaries will appear in the MONTHLY WEATHER REVIEW for January, 1924.

The only flood in the Atlantic States occurred in the Santee River. It was inconsequential and was accurately forecast.

There were no floods in the Alabama River, nor in its tributaries, but after the heavy rains of December 4 the lower Tombigbee River was above the flood stage from December 6 until about the end of the month. The crest stage at Demopolis, Ala., was 43.8 feet, or 4.8 feet above the flood stage, on December 10, with secondary crests of 42.9 and 43.7 feet on December 18 and 26, respectively. Warnings were issued when necessary, beginning with December 5. Losses reported did not exceed \$2,000.

There were moderate floods in the Pearl River of Mississippi during the third week of the month that were also forecast, as well as three equally moderate crests in the West Pearl River of Louisiana during the first half of the month. Total losses reported were \$6,000, and the value of property saved through the warnings, \$3,000, not including the value of livestock saved for which no estimate could be obtained.

Moderate rains over the upper Wabash Valley of Indiana during the day and night of December 4 resulted in some local flood-stages over that section, and a general rise a little later throughout the Valley. Heavier and more general rains on December 12 and 13 created general flood conditions that also extended over the greater portion of the lower White River Valley and continued at the close of the month in the lower White and lower Wabash Rivers. Timely warnings were issued frequently but considerable damage was done. In the lower Wabash Valley about 2,000 acres of unhusked soft corn, valued at \$40,000, were lost and other reported crop losses amounted to \$24,000. Damage to levees was approximately \$25,000. The value of property saved through the warnings was \$42,000, chiefly in crops that could be moved.

Local floods in the interior rivers of southern Ohio and in the Illinois River of Illinois were unimportant.

On account of heavy rains of December 12 and 13, a moderate flood prevailed in the extreme lower Neosho River of Oklahoma and in the Arkansas River from Webbers Falls, Okla., eastward. The crest stage at Fort Smith, Ark., on December 15 was 3 feet above flood stage of 22 feet. Otherwise flood stages were not general, although the damage done was considerable, notwithstanding the early dissemination of the flood warnings. In the Fort Smith District the reported losses were, real property, \$25,000; suspension of business,

\$18,000, and prospective crops only \$5,000, although about 12,000 acres of farm lands were overflowed. Value of property saved through the flood warnings, \$5,000. Figures for the Little Rock, Ark., district were not available, but all stock and most of the crops were removed in time. However, some fields of corn were lost, and the State Dairy Farm suffered great loss by reason of caving banks.

The rains from December 10 to 13, inclusive, were equally heavy south of the Arkansas Valley with resultant general floods in the Red River and the rivers of Texas from the Guadalupe eastward. The floods were not severe, except in the upper Trinity River of Texas, and they were well forecast as a rule.

In the vicinity of Shreveport, La., caving banks caused a loss of probably more than \$100,000, but elsewhere in the Red River Valley losses were small. No other figures were available, but in the Sulphur River district of Texas damage to levees, fences and roads was estimated at \$3,400, while the value of property saved through the warnings was given as \$15,000. In the Brazos and Trinity Valleys losses were small, owing to the fact that crops had been removed, and only \$70,000 were reported, of which \$33,500 was due to suspension of business. Some cattle and hogs were lost notwithstanding the warnings, but the value of property saved was reported as \$125,000 plus a large amount of livestock. In the Guadalupe Valley all stock was removed from the lowlands and there were no losses.

There were no other floods except some minor ones in the Gila and Salt Rivers of Arizona on December 28, the Willamette River at Eugene, Oreg., on December 7 and the Santiam River of Oregon on December 7 and 29. No reports on these latter floods were received.

River and station.	Flood stage.	Above flood stages—dates.		Crest.	
		From—	To—	Stage.	Date.
ATLANTIC DRAINAGE.					
Santee:	<i>Feet.</i>			<i>Feet.</i>	
Rimini, S. C.....	12	8	11	13.6	11
		20	22	13.3	21
Ferguson, S. C.....	12	11	12	12.3	11
		21	25	12.5	22-25
Broad: Carlton, Ga.....	11	5	5	11.9	5
EAST GULF DRAINAGE.					
Tombigbee: Look 4, Demopolis, Ala.....	39	6	30	43.8	10
Pearl:					
Jackson, Miss.....	20	15	20	20.6	18
		22	29	22.3	25
Columbia, Miss.....	18	25	26	18.8	25
West Pearl: Pearl River, La.....	13	2	7	14.7	4
		9	12	14.5	10
		14	(1)	15.7	27
MISSISSIPPI DRAINAGE.					
Ohio:					
Evansville, Ind.....	35	30	(1)		
Dam 48, Cypress, Ind.....	35	15	19	37.0	17
		24	(1)		
Shawneetown, Ill.....	35	28	(1)		
Little Kanawha: Glenville, W. Va.....	23	31	(1)		
Walhonding: Walhonding, Ohio.....	8	14	14	9.8	14
		23	23	8.6	23
Scioto: Circleville, Ohio.....	10	15	15	13.2	15
		23	25	12.8	24
Green:					
Look 4, Woodbury, Ky.....	33	25	25	33.8	25
Look 2, Rumsey, Ky.....	34	27	28	34.6	28
Wabash:					
La Fayette, Ind.....	11	6	8	15.2	7
		14	17	17.5	15
		22	26	14.7	24-25
Terre Haute, Ind.....	16	17	20	16.8	19
Vincennes, Ind.....	14	21	26	15.4	23
Mount Carmel, Ill.....	15	12	(1)	21.3	22
White: Decker, Ind.....	18	15	(1)	20.9	22
White, East Fork: Seymour, Ind.....	10	14	16	11.5	15
		23	23	11.0	23
White, West Fork:					
Edwardsport, Ind.....	14	10	29	17.6	24
Elliston, Ind.....	19	11	11	19.5	11
		14	18	22.7	16-17
		23	24	19.3	24

1 Continued at end of month.

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River and station.	Flood stage.	Above flood stages—dates.		Crest.	
		From—	To—	Stage.	Date.
<b>MISSISSIPPI.</b>	<i>Feet.</i>			<i>Feet.</i>	
Illinois:					
Peru, Ill.	14	14	(1)	15.1	17-18
Henry, Ill.	7	13	(1)	8.9	29-31
Beardstown, Ill.	12	14	(1)	14.9	26-27
Meramec: Pacific, Mo.	11	13	16	14.4	16
Bourbeuse: Union, Mo.	10	15	15	13.6	15
St. Francis: Marked Tree, Ark.	17	23	(1)		
Arkansas:					
Fort Smith, Ark.	22	14	16	25.0	15
Dardanelle, Ark.	20	14	17	22.0	16
Neosho: Fort Gibson, Okla.	22	14	14	22.0	14
Petit Jean: Danville, Ark.	20	13	17	23.3	15
Cache: Patterson, Ark.	9	17	(1)		
Red:					
Index, Tex.	27	18	18	27.0	18
Fulton, Ark.	28	16	27	31.4	19
Alexandria, La.	36	26	(1)		
Sulphur:					
Ringo Crossing, Tex.	20	12	13	25.4	19
Finley, Tex.	24	21	26	22.9	23
Cypress: Jefferson, Tex.	18	16	31	27.8	18
Ouachita: Camden, Ark.	39	31	(1)		
		17	18	30.6	18
<b>WEST GULF DRAINAGE.</b>					
Sabine:					
Logansport, La.	25	23	(1)	28.2	26-27
Bon Wier, Tex.	20	23	29	21.1	25-26
Orange, Tex.	4	23	(1)	5.7	25
Neches:					
Rockland, Tex.	22	26	26	22.0	26
Beaumont, Tex.	7	22	(1)	10.4	25
Trinity:					
Dallas, Tex.	25	12	20	38.1	15
Trinidad, Tex.	28	14	27	38.5	21
Long Lake, Tex.	40	19	28	41.5	25-26
Liberty, Tex.	25	22	(1)	27.5	28-29
Elm Fork: Carrollton, Tex.	7	13	14	12.8	14
Brazos, Little: Little River, Tex.	30	13	13	37.0	13
Gaudalupe:					
Gonzales, Tex.	22	14	15	23.6	15
Victoria, Tex.	16	15	21	21.7	22
<b>COLORADO DRAINAGE.</b>					
Gila:					
Kelvin, Ariz.	5	28	(1)	6.4	29
Gila Bend, Ariz.	5	28	28	6.0	28
Salt: Phoenix, Ariz.	5	27	28	9.6	27
<b>PACIFIC DRAINAGE.</b>					
Willamette: Eugene, Oreg.	10	7	7	12.0	7
Santiam: Jefferson, Oreg.	10	7	7	11.0	7
		29	29	12.0	29

<sup>1</sup> Continued at end of month.

### MEAN LAKE LEVELS DURING DECEMBER, 1923.

By UNITED STATES LAKE SURVEY.

[Detroit, Mich., Jan. 7, 1924.]

The following data are reported in the "Notice to Mariners" of the above date:

Data.	Lakes. <sup>1</sup>			
	Superior.	Michigan and Huron.	Erie.	Ontario.
Mean level during December, 1923:	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>
Above mean sea level at New York.....	601.78	578.80	571.29	244.47
Above or below—				
Mean stage of November, 1923.....	-0.25	-0.28	+0.29	+0.13
Mean stage of December, 1922.....	-0.24	-0.38	+0.18	-0.17
Average stage for December last 10 years.....	-0.58	-1.27	-0.49	-0.91
Highest recorded December stage.....	-1.35	-3.78	-2.24	-3.14
Lowest recorded December stage.....	+0.58	-0.20	+0.43	+1.04
Average relation of the December level to—				
November level.....		-0.2	-0.2	-0.2
January level.....		+0.1		-0.1

<sup>1</sup> Lake St. Clair's level: In December, 1923, 573.97 feet.

### EFFECT OF WEATHER ON CROPS AND FARMING OPERATIONS. DECEMBER, 1923.

By J. B. KINCER.

The month, as a whole, was favorable for agricultural interests in most sections of the country, though it was generally unfavorable for farm work in the Southern States because of frequent rains and wet soil, while outdoor operations were hindered considerably by the same cause in the Ohio Valley area. Unusually mild, open weather was experienced in the central and northern Great Plains, and seasonal farm operations made good progress.

The principal winter-wheat area was bare of snow throughout almost the entire month, but the weather was not severe enough to be materially harmful until near the close when the first severe cold wave of the season overspread the Northern and Central States. Grain fields were generally protected by snow cover during the prevalence of this cold wave in the Northern, Western, and Northwestern States, including most of the wheat fields in Kansas, but some slight injury was reported from freezing locally in the Ohio Valley States. Earlier in the month there was some damage by overflow in some parts of the Ohio Valley.

Corn fields were soft and muddy during much of the month in the East-Central States, and husking was considerably delayed, especially in parts of the Ohio Valley. Husking made good progress, under favorable weather conditions, in the Great Plains and more northwestern States. Conditions were rather unfavorable for completing cotton picking in the western portions of the belt, but this work made good progress in the far Southwest, including the Imperial Valley of California.

A cool wave near the middle of the month damaged truck crops some in Texas and, at the same time, some slight harm was done to tender vegetation in central Gulf districts. Rain during the first half of the month benefited truck in the Gulf States, but drier weather and more sunshine were needed the latter part.

The month was unusually favorable for stock in the great western grazing districts until near its close when stormy weather and a severe cold wave prevailed. This storm mostly covered the range with snow, and the low temperatures unfavorably affected stock in the central and northern Rocky Mountain districts. The snow was beneficial in Montana, however, in replenishing stock water on the range, while the weather was generally helpful to stock interests east of the Plains area. A severe drought prevailed in California which unfavorably affected the range and livestock.